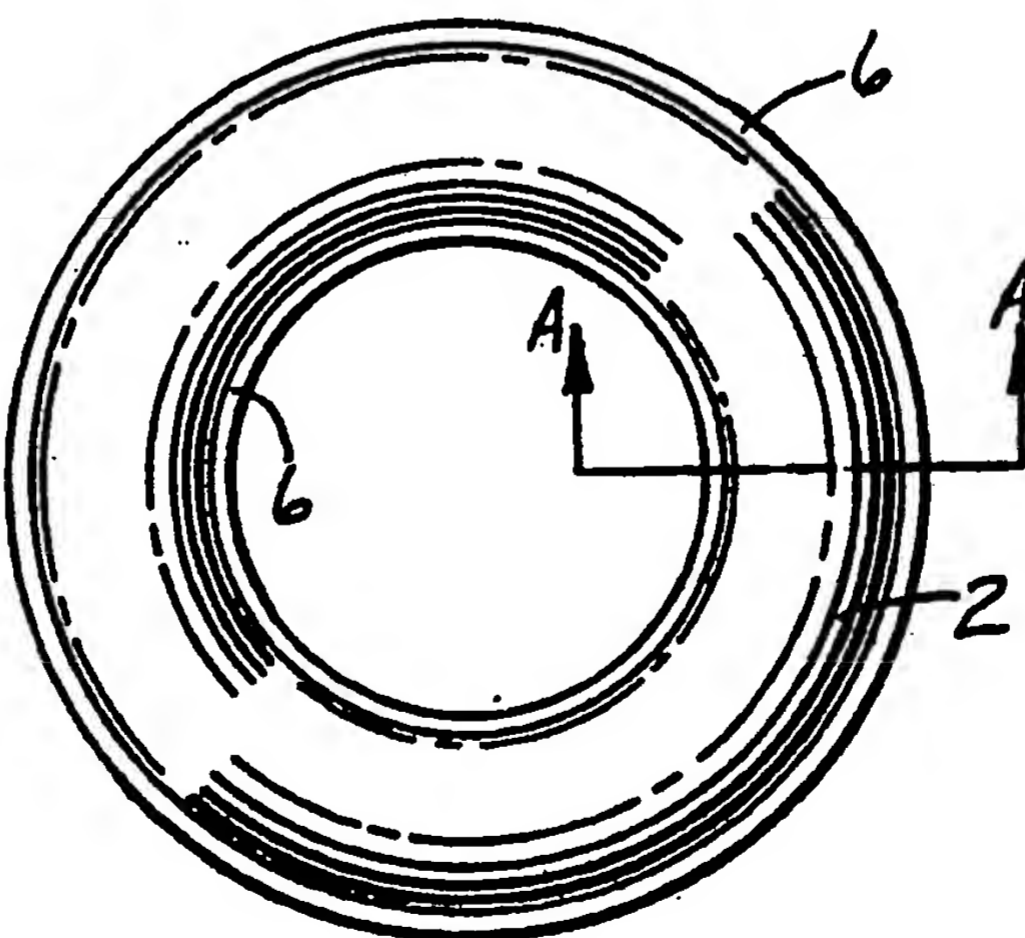




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/US92/02030 <b>(22) International Filing Date:</b> 13 April 1992 (13.04.92) <b>(30) Priority data:</b> 9108385.7 19 April 1991 (19.04.91) GB <b>(71) Applicant (for all designated States except US):</b> MINNESOTA MINING AND MANUFACTURING COMPANY [US/US]; Post Office Box 33427, Saint Paul, MN 55133-3427 (US). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only) :</b> BASTOW, David, R. [GB/GB]; 64 Deltic, Glascote Heath, Tamsworth, Staffordshire B77 2DU (GB). <b>(74) Agents:</b> HUEBSCH, William, L. et al.; Post Office Box 33427, Saint Paul, MN 55133-3427 (US).		<b>(81) Designated States:</b> AT (European patent), AU, BE (European patent), BR, CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, KR, LU (European patent), MC (European patent), NL (European patent), SE (European patent), US.  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> MASKING METHODS USING A FOAM WEB    <b>(57) Abstract</b>  A masking element comprising a foam web (2) formed into a closed curve defining upper and lower surfaces with a layer of adhesive on at least its lower surface for mounting the element on a substrate.		

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MASKING METHODS USING A FOAM WEBTechnical Field

The present invention relates to the masking of an  
5 exposed area of a surface from an adjacent area to  
facilitate treatment of the exposed area by for example  
paint spraying. The invention has particular, but not  
exclusive application in the motor industry where  
selective repairs must be effected on painted surfaces.  
10 The invention also relates to a masking element for use  
in such methods.

Background Art

Various masking techniques are known for isolating  
15 areas from adjacent areas on a surface. Such isolation  
is needed in a number of situations where treatment of  
one form or another is to be applied exclusively to a  
specific area or region. Masking techniques are  
particularly useful when the treatment involves the  
20 application of a fluid medium. Examples are chemical  
treatments, painting and decorating. Typically, the  
treatment areas are isolated from their surroundings by  
a masking tape which defines the boundary thereof.

25 Disclosure of Invention

The present invention is directed at a masking  
element which can be manufactured and sold as a complete  
unit ready for immediate use. More particularly, the  
invention provides a masking element comprising a foam  
30 web formed into a closed curve defining upper and lower  
surfaces, with a layer of adhesive on at least the lower  
surface for mounting the element on a substrate. The  
closed curve is typically circular or elliptical, but can  
be polygonal or any chosen shape. The actual form of the  
35 curve is not critical, but is preferably chosen such that  
a plurality of elements can be formed simultaneously from  
a single sheet of material. Such a plurality of elements

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can be arranged concentrically, and stamped from such a sheet simultaneously. Further, such a plurality of elements can be marketed in this form, with elements being available for removal from the sheet as they are  
5 required.

Preferred masking elements according to the invention are formed from a foam material, and can conveniently be stamped from a sheet of foam which already has a layer of adhesive on at least one face  
10 thereof. The inner and outer peripheries of the element can be defined by pressure welded seams formed during the stamping, and where a plurality of concentric elements are formed simultaneously, radially adjacent elements can be attached to each other along their respective  
15 peripheries, and by such pressure welded seams, which may be readily tearable.

#### Brief Description of Drawing

The invention will now be described by way of  
20 example and with reference to the accompanying schematic drawings wherein:

Figure 1 is a plan view of a circular masking element according to the invention;

Figure 2 is a section taken on line A-A of Figure 1;

25 Figure 3 is a plan view of a sheet of material in which a plurality of masking elements of the invention have been stamped out;

Figure 4 is a perspective view of a part of a car hood; and

30 Figure 5 is cross-section taken on line V-V of Figure 4.

#### Detailed Description

As shown in Figures 1 and 2, a masking element  
35 according to the invention takes the form of an endless length of foam web having a generally elliptical cross-section. On the lower surface of the web 2 is

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applied an adhesive coating 4, which as can be seen from Figure 2, extends around substantially half the peripheral surface of the web 2. A typical height of the section shown in Figure 2 is 15mm, and a typical breadth is 20mm. These are preferred minimum values for webs made from polyether foam which is particularly suitable, but other plastics foams can also be satisfactory. Similarly, a typical minimum outside diameter for a masking element of the kind shown in Figure 1 is 95mm, which enables the element to isolate an area of around 70cm<sup>2</sup>.

The foam web forming the mask element shown in Figures 1 and 2 is as noted above, preferably a plastics foam. Typically, it can be a foam made in accordance with our published European Patent Specification No. 0384626, with pressure welded seams 6 defining either lateral side of the web section. Forming the element in this way makes it particularly suitable for batch production, in which a plurality of elements can be simultaneously stamped out of a sheet of foam material, broadly as illustrated in Figure 3.

In Figure 3 five concentric elements are shown formed in a sheet 8 of foam material. The webs 2a, 2b and 2c of radially adjacent elements are separated from one another by pressure welded seams 6a and 6b. The seams are tearable, but as shown the sheet 8 remains intact under normal handling conditions. When one of the elements is required, its respective seams are torn to separate it from the remainder of the sheet.

The sheet 8 shown in Figure 3 may have a layer 4 of adhesive (not shown) coated thereon prior to it being stamped to identify the respective masking elements. After stamping, and as shown in Figure 2. The material contracts around the body of each web 2 resulting in the adhesive coating 4 extending around either side of the web. It will be appreciated that an adhesive coating of this form may be applied to both surfaces of the foam 8,

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to result in a web likewise having two adhesive coatings. The adhesive coatings need not be of the same aggressive strength. Reference is directed to our co-pending Application filed today in respect of an invention relating to the use of strips similar to the web 2 described herein with two adhesive coatings. Release liners can also be applied to the sheet 8 to facilitate handling not only of the sheet, but also of the masking elements formed therein. If desired, the release liners can be cut into separate rings, or perforated to permit easy separation.

Figures 4 and 5 illustrate the use of a masking element according to the invention. Figure 4 shows the front section of a car hood 10, most of which is to be re-painted. An emblem 12 is mounted on the hood 10, and as the paintwork around the emblem 12 does not require re-painting, this area of the hood is to be isolated from the remainder. To achieve this, an endless element 14 according to the invention is mounted on the hood 10 to surround the emblem 12. This is shown more clearly in Figure 5.

As shown in Figure 5, the web 2 of the element 14 is secured to the hood 10 by the adhesive layer 4. In this embodiment, an adhesive coating 16 is also formed on the opposite surface of the web 2, and a sheet 18 of paper or other suitable material is laid thereover and attached to the web 2 by the adhesive 16 to protect the emblem and its immediate surroundings. Alternatively of course, an adhesive coating can be separately applied to the web 2 or the sheet 18 could be formed with an adhesive coating of its own suitable for securing the sheet to the uncoated exposed surface of the web 2.

The sheet 18 can be cut to size before or after attachment to the element 14. In some embodiments of the invention, the element 14 can be provided with a masking sheet already attached. Generally though, elements according to the invention will be provided without such

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sh ets, and usually in a batch as illustrated in Figur 3. This will permit th element to be used to mask an enclosed area as illustrated in Figur s 4 and 5, r to surround such an enclosed area while leaving it exposed 5 for treatment. In the latter application, any sheet of material applied will extend outwards from the element rather than inwards.

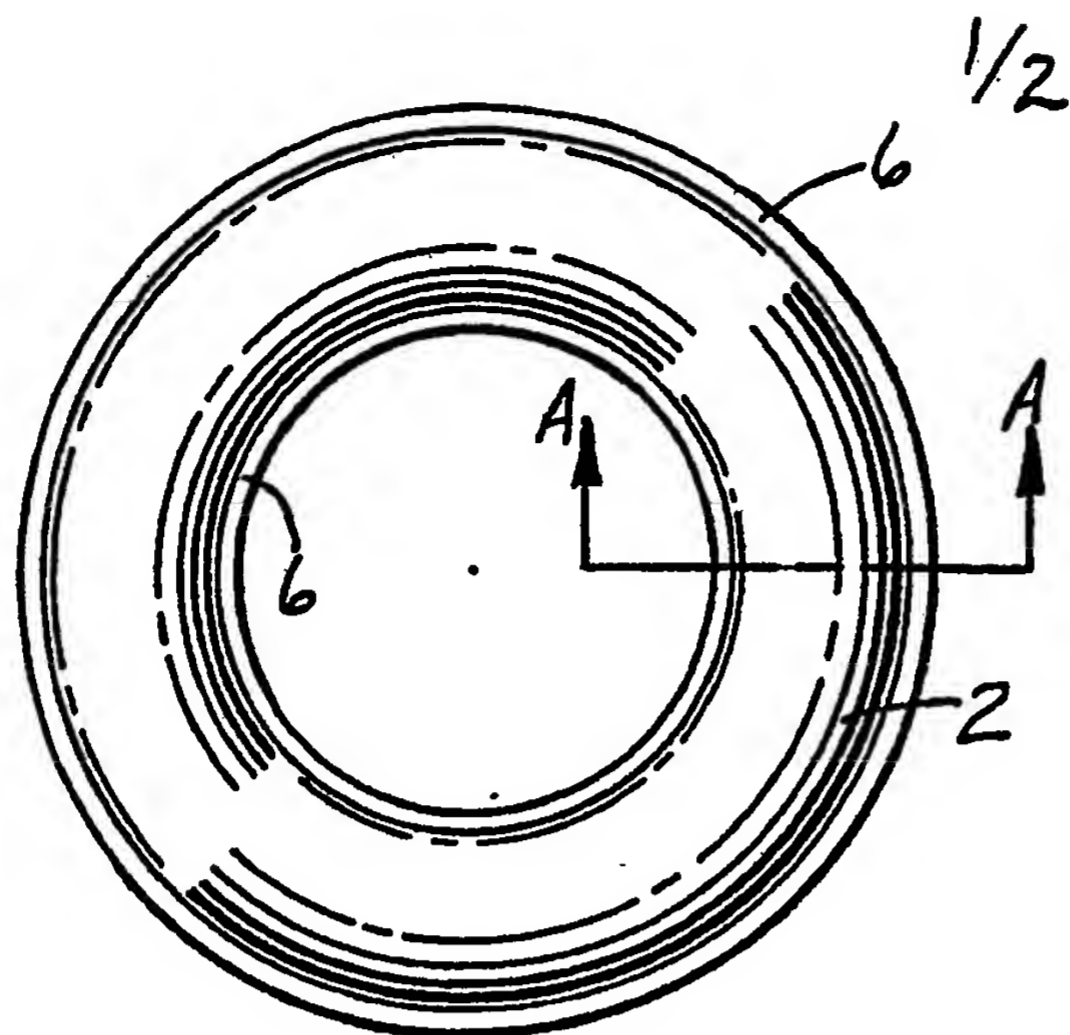
Elements according to the invention have particular benefit in effecting paint repairs. The use of a foam 10 web facilitates the achievement of a soft edge between painted and unpainted areas. However, the elements are also useful in applying other surface treatments such as coating, plating and phosphorizing.

CLAIMS

1. A masking element comprising a foam web formed into a closed curve defining upper and lower surfaces with a layer of adhesive on at least the lower surface for mounting the element on a substrate.
2. A masking element according to Claim 1 wherein the closed curve is a circle.
3. A masking element according to Claim 1 wherein the closed curve is a polygon.
4. A masking element according to any preceding Claim wherein said upper and lower surfaces are curved.
5. A masking element according to Claim 4 wherein the web has an elliptical cross-section.
6. A masking element according to any preceding Claim wherein the web is stamped out in the shape of the closed curve from a sheet of foam with a layer of adhesive on one face thereof.
7. A masking element according to Claim 6 wherein the inner and outer peripheries of the element are defined by pressure welded seams formed during the stamping.
8. A plurality of substantially concentric masking elements according to Claim 6 or Claim 7 formed in a common sheet of foam.
9. A plurality of elements according to Claim 8 herein radically adjacent elements are attached to each other along respective peripheries thereof.

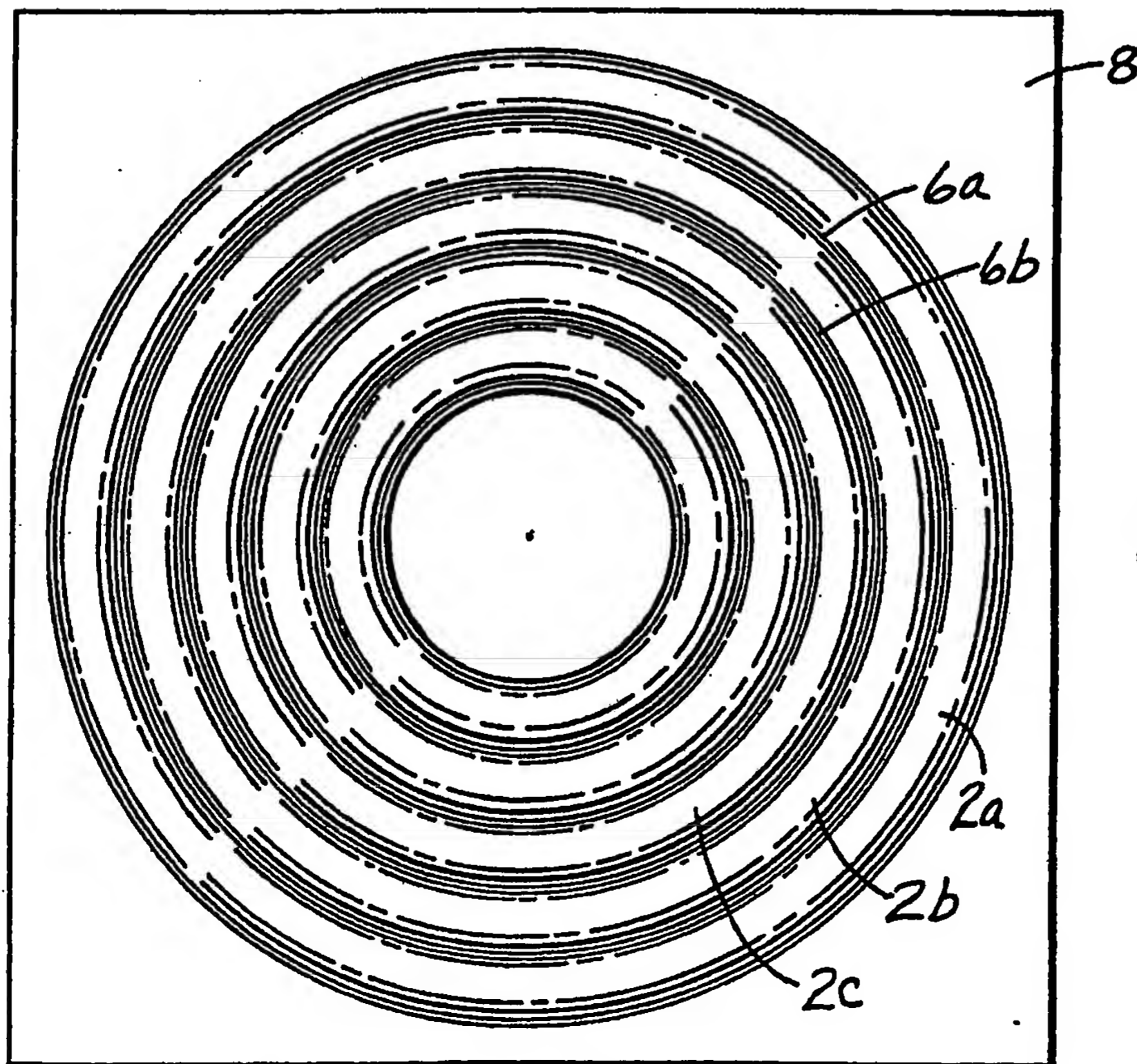
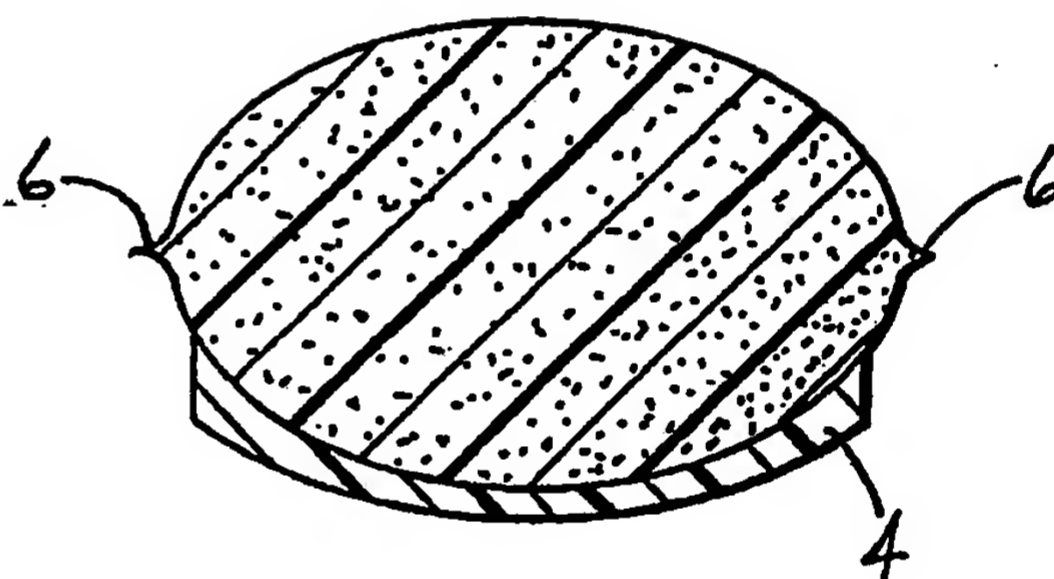
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10. A plurality according to Claim 9 or elements according to Claim 7 wherein adjacent elements are attached by transverse welded seams.

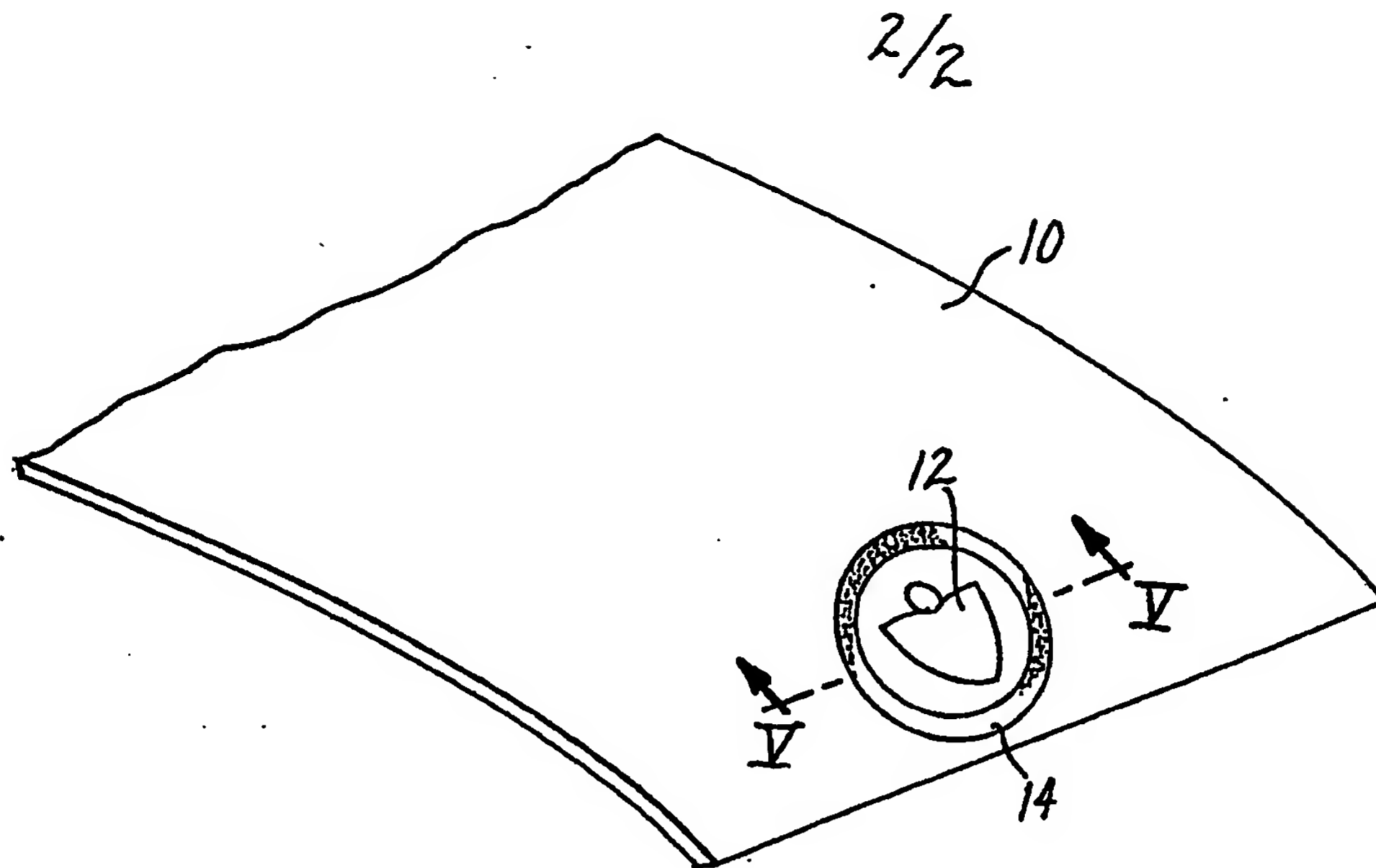


**Fig. 1**

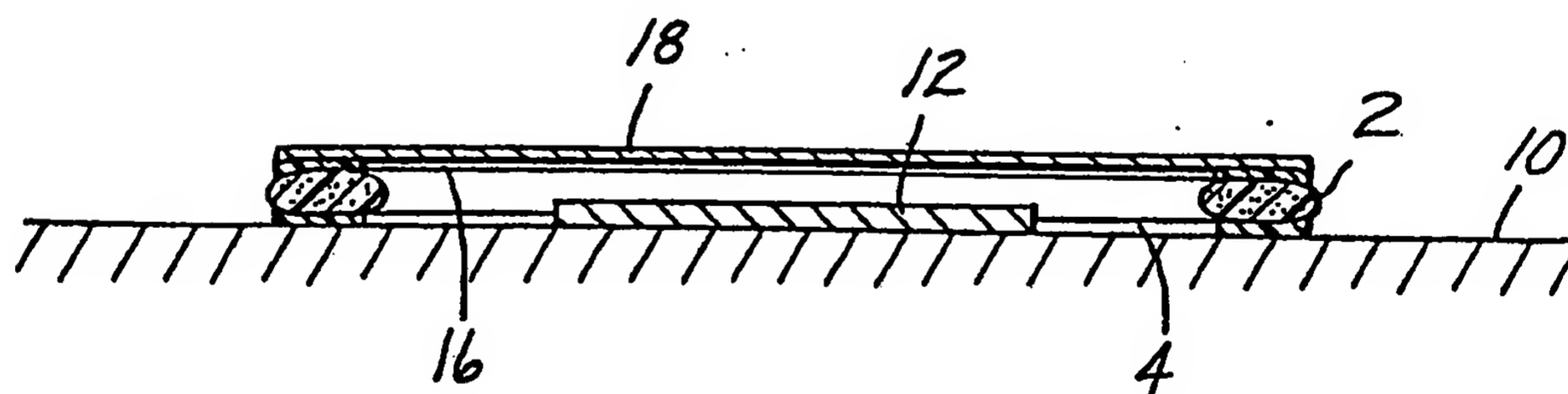
**Fig. 2**



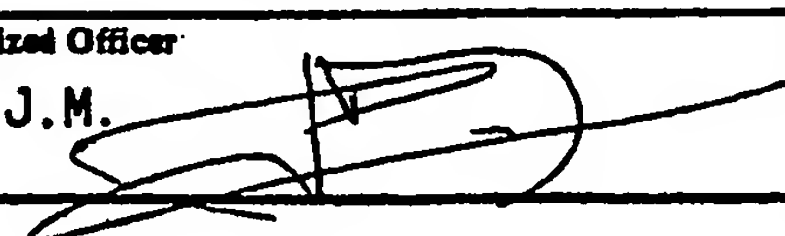
**Fig. 3**



**Fig. 4**



**Fig. 5**

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>6</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 B05B15/04; B05D1/32		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
Int.Cl. 5	B05C	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>8</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup></b>		
Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
X	DE,A,3 312 201 (DECKER) 18 October 1984 see the whole document ---	1,2
A	EP,A,0 384 626 (MINNESOTA MINING AND MANUFACTURING COMPANY) 29 August 1990 cited in the application see the whole document ---	1-7
A	WO,A,9 015 668 (FRESCO LINE) 27 December 1990 ---	
A	BE,A,1 001 535 (SILVESTRE) 21 November 1989 ---	
<p><sup>10</sup> Special categories of cited documents : <sup>10</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
1 21 JULY 1992	07.08.92	
International Searching Authority	Signature of Authorized Officer	
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**ANNEX TO THE INTERNATIONAL SEARCH REPORT  
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.  
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-A-3312201	18-10-84	None	
EP-A-0384626	29-08-90	CA-A- 2009721	20-08-90
WO-A-9015668	27-12-90	SE-B- 463656	07-01-91
		AU-A- 5846690	08-01-91
		SE-A- 8902153	16-12-90
BE-A-1001535	21-11-89	AU-A- 4214589	18-04-90
		WO-A- 9003228	05-04-90
		EP-A- 0365510	25-04-90
		JP-T- 3501464	04-04-91